

Monitoring well
sampling for
 NO_3 , NO_2 , TKN, NH_3
- 3 wells per
quarter

Quil Ceda Village Council

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Thor Cutler
U.S. EPA - Region 10
1200 Sixth Avenue, OW-137
Seattle, WA 98101

Dec 16, 02

Re: Quil Ceda Village Treated Effluent Infiltration system: Inventory and Assessment for Rule
Authorization (EPA's letter 12.02.02)

Dear Mr. Cutler:

Thank you for providing comments on the inventory and assessment document for rule authorization titled '*Quil Ceda Village Treated Effluent Infiltration System*'. As you may recall, final design is complete and the plant is approximately forty percent constructed. We anticipate beginning operations in early May 2003.

As a general comment, the Village agrees to complete effluent and groundwater monitoring as proposed by EPA with minor modification. In our inventory and assessment document, the Village proposed monitoring more substances at generally greater frequencies than proposed by EPA (see Table 5-1 in the inventory and assessment document). The Village will conduct this more intensive monitoring; however, the Village would prefer that the Rule Authorization approval require only the essential monitoring you listed. The Village's additional monitoring will be completed in support of an NPDES permit application for discharge to surface water, and should not be required as part of routine long-term monitoring for Rule Authorization.

Groundwater Monitoring

The Village will monitor groundwater beneath the effluent infiltration system for nitrogen, in addition to the plant's effluent monitoring. The Village proposes quarterly sampling of groundwater wells located at three of the 19 infiltration sections. The specific wells tested will be located within the three most heavily used infiltration sections, based on the on-site flow meter readings two weeks prior to sampling. Samples will be analyzed for nitrate, nitrite, TKN, and ammonia.

For the first 9 months of operation, the Village will monitor monthly groundwater in three groundwater wells for phosphorus to provide data for a phosphorous study (see below). Thereafter, groundwater monitoring for phosphorus will be conducted only if the phosphorus study indicates a significant impact to groundwater or surface water.

Turbidity
instead of
TSS

Effluent Monitoring

The Village concurs with EPA's request for weekly monitoring of fecal coliform bacteria. We propose to decrease the monitoring frequency for fecal coliform bacteria to monthly following the first year's operation if monitoring data is satisfactory.

If necessary, our government is willing to complete weekly TSS monitoring to obtain facility rule authorization; however, the Village believes weekly TSS monitoring is unnecessary given that 1) plant sensors continuously monitor effluent turbidity, and 2) effluent turbidity is expected to be less than 0.1 NTU. As such, TSS levels will be below the analytical method detection limit. In lieu of your request, the Village proposes to complete monthly TSS monitoring for the first year, as described in the inventory and assessment document, to confirm the expected low TSS levels.

Village staff will monitor the plant's effluent weekly for phosphorus. After the first nine months of facility operation, we propose monitoring phosphorus only if the phosphorus study indicates a significant impact to groundwater or surface water.

Phosphorus Study

The Village proposes completing a full operational phosphorous study during the first 9 months of facility operation, and submitting to EPA an evaluation of phosphorus impacts to groundwater and surface water within 12 months following system startup. As described above, the Village will monitor plant effluent for phosphorus weekly, and monitor groundwater beneath the three most heavily used infiltration sections monthly, for the first 9 months of facility operation. Approximately every fourth effluent sample will be collected concurrently with the groundwater sampling to aid in estimating phosphorus removal rates. Samples will be analyzed for total phosphorous and ortho-phosphate. Organic phosphorus will be calculated as the difference between total and ortho-phosphorus.

We propose this approach because assessing impacts to groundwater and surface water require estimating the following:

- Phosphorous loadings to the MBR sewage treatment plant
- Phosphorous removal rates by the MBR sewage treatment plant
- Phosphorous removal rates at the infiltration system
- Capture of groundwater by Quil Ceda Creek (capture of 100 percent was assumed in the groundwater flow model, but site monitoring data supports a conclusion that capture is less than 100 percent).

These factors can not be reliably quantified at this time. Completing the study following system startup allows phosphorous loading rates, and removal rates by infiltration, to be measured directly rather than estimated.

Nevertheless, responding to your evaluation request, the Village believes significant removal of phosphorus during infiltration and groundwater transit is highly probable. Although hydraulic loading rates are higher than many systems, infiltrated effluent will flow through 700 to 2000 feet of soil prior to discharging to Quil Ceda Creek. Flow times are relatively long (estimated at 1 to 3 years), providing ample time and capacity for phosphorus attenuation. EPA's *Process Design Manual: Land Treatment of Municipal Wastewater* (EPA 625/1-81-013) presents data indicating phosphorous removal rates for rapid infiltrations systems ranging from 30 to 97 percent after flow distances of 1 to 18 meters vertical and 0 meters horizontal. With significant horizontal flow distances, all sites listed indicated phosphorous removal rates greater than 90 percent.

Herein, we provide this preliminary phosphorous loading evaluation to surface water using the following assumed data:

- 2.5 mg/L phosphorus in the MBR sewage treatment plant discharge (typical for commercial wastewater based on preliminary literature review)
- Effluent infiltration of 250,000 gallons per day
- 90 percent attenuation of phosphorous by soil
- Summer time low flow in Quil Ceda Creek of 7 cfs

Based on these data, the resulting increase in phosphorus in Quil Ceda Creek would be only 0.014 mg/L. This compares to measured average phosphorus concentrations in Quil Ceda Creek of 0.11 mg/L (see Table 3-3 of inventory and assessment document).

The above evaluation indicates that impact to Quil Ceda Creek is likely to be low. Confirming this conclusion through a study following facility startup is reasonable.

RULE AUTHORIZATION

With this letter, the Villages assumes that the inventory and assessment for rule authorization of the proposed facility is complete. The Village awaits EPA's approval, and anticipates that EPA will issue the rule authorization in the near future.

Please call Ken Fellows (253-863-5128) or T. McKinsey (360-651-3279) if you have any questions.

Sincerely,


John McCoy
Village Manager

Cc: T. Mac McKinsey, Quil Ceda Village
Mike Ollivant, Parametrix, Inc.
Ken Fellows, Parametrix, Inc.
Tim Hamlin, U.S. EPA

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